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Section: Original Investigation

**Article Title:** Physical Demands of Match-Play in Successful and Less-Successful Elite Rugby League Teams

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**Journal:** *International Journal of Sports Physiology and Performance*

**Acceptance Date:** August 13, 2014

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**DOI:** [http://dx.doi.org/10.1123/ijspp.2014-0080](http://dx.doi.org/10.1123/ijspp.2014-0080)
Running Title: PHYSICAL DEMANDS OF RUGBY LEAGUE

Physical demands of match-play in successful and less-successful elite rugby league teams

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Submission Type: Original Investigation
Abstract Word Count: 250 Words
Text-Only Word Count: 3445 Words
Number of Figures and Tables: 1 Table, 3 Figures
Abstract

**Purpose:** This study: (1) quantified activity profiles in approximately 5-minute periods to determine if the intensity of rugby league match-play changes following the most intense period of play, and (2) examined if the intensity of activity during predefined periods of match-play differed between successful and less-successful teams playing at an elite standard.

**Methods:** Movement was recorded using a minimaxX global positioning system (GPS) unit (Catapult Innovations, Melbourne, Australia) sampling at 10 Hz during 25 rugby league matches, equating to 200 GPS files. Data for each half of match-play were separated into 8 equal periods. These periods represented: (1) the most intense phase of match-play (peak period), (2) the period following the most intense phase of match-play (subsequent period), and (3) the average demands of all other periods within a match (mean period). Two rugby league teams were split into a ‘high-success’ or ‘low-success’ group based on their success rates throughout their season. **Results:** Compared with their less-successful counterparts, adjustables, and hit-up forwards from the high-success team covered less total distance ($P<0.01$), less high-intensity running distance ($P<0.01$), and were involved in a greater number of collisions ($P<0.01$) during the mean period of match-play. **Conclusions:** Although a greater number of collisions during match-play is linked with a greater rate of success, greater amounts of high-intensity running and total distance are not related to competitive success in elite rugby league. These results suggest that technical and tactical differences, rather than activity profiles, may be the distinguishing factor between successful and less successful rugby league teams.

**Keywords:** winning; losing; activity profiles; team sport; time-motion analysis
Rugby league is an international team sport that is 80 minutes (2 x 40-minute halves) in duration.\textsuperscript{1,2} Like Australian football,\textsuperscript{3,4} soccer,\textsuperscript{5-7} and hockey,\textsuperscript{8} rugby league involves brief periods of high-intensity running interspersed with longer periods of low-intensity activity.\textsuperscript{9-11} Rugby league players are often required to perform collisions, accelerations, and high-speed running efforts with minimal recovery between efforts.\textsuperscript{11} Three or more sprints, high-intensity accelerations, or tackles with less than 21 seconds recovery between high-intensity efforts has been defined as a repeated high-intensity effort bout.\textsuperscript{9,11} Interestingly, 70% of all repeated high-intensity effort bouts occur in the 5-minute period preceding a try.\textsuperscript{9} Clearly, even though high-intensity exercise represents the minority of rugby league match-play,\textsuperscript{9-11} success (or lack of success) may be influenced by a team’s ability (or inability) to perform repeated bouts of high-intensity activity.

In soccer, temporary reductions in high-intensity activity follow the most intense passages of play.\textsuperscript{5,6,12-14} Mohr et al\textsuperscript{14} established that in the 5-minute period following the greatest amount of high-intensity running, there was a 12% reduction in high-intensity running compared with the average demands of a match. A more recent study has also shown that high-intensity running decreases below the match average in the 5-minute period subsequent to the most intense phase of the game, and then recovers in the following 5-minute period.\textsuperscript{6} However, it has also been demonstrated that ‘ball-in-play’ time can differ between 5-minute periods of match-play, therefore limiting the opportunity to perform physical work.\textsuperscript{15} Given that rugby league also has periods of intermittent high-intensity running coupled with collisions,\textsuperscript{11} these methods of investigating temporary reductions in performance within a match could offer valuable insight into the performance fluctuations of rugby league match-play. Furthermore, given that recent evidence has demonstrated that the phase of play (i.e. attacking or defending) can affect the physical demands of match-play,\textsuperscript{16}
this factor must be considered, along with other confounding variables such as ball-in-play time.\textsuperscript{17}

Kempton et al\textsuperscript{18} examined the effect of the most intense period of match-play on physical and technical performance in elite senior and junior ‘ball-playing’ positions (i.e. hooker, halfback, five-eighth, and fullback) within rugby league teams having low success rates (elite, 36\% of matches won; junior elite, 13\% of matches won). These ‘ball-playing’ positions have an important role of providing team structure and coordinating attacking movements,\textsuperscript{19} and the number and quality of their skill performances have been shown to reduce in the 5-minute period following the peak intensity period of match-play.\textsuperscript{18} However, given that the ability to execute a range of skills under fatigue is able to discriminate between players competing at different levels of competition,\textsuperscript{20} these findings\textsuperscript{18} may not be representative of the fatigue response of players from teams with higher success rates.

There is currently a lack of evidence relating to differences in the intensity of match-play between successful and less successful teams in rugby league. Although one study demonstrated increases in total distance were related to greater competitive success of one team,\textsuperscript{21} there is a paucity of evidence comparing separate teams with high- and low-success rates. Studies from soccer have demonstrated that teams finishing in the bottom five ladder positions cover greater high-intensity running distance than teams finishing in the top five positions.\textsuperscript{22} In contrast with earlier studies\textsuperscript{14} it has been highlighted that teams competing in higher divisions of competition cover less total distance and less high-speed distance than teams competing in lower divisions of competition.\textsuperscript{23} One of the few studies that have investigated match intensities between successful and less-successful rugby league teams was conducted by dividing first and second half data into quartiles.\textsuperscript{24} The results demonstrated that playing intensities during the selected quartiles of match-play differed between winning and losing semi-elite rugby league teams, with winning teams producing higher intensities
than losing teams. Although this study only investigated these relationships amongst hookers, second-rowers, and locks (i.e. backs and props were excluded), the findings clearly show that match intensities differ between successful and less-successful semi-elite rugby league teams. However, whether these relationships remain consistent amongst elite teams and all positional groups remains unclear.

Further additions to the understanding of rugby league activity profiles could be offered by investigating differences in segmental activity profiles of: (1) all positional groups during a rugby league match, and (2) successful and less-successful rugby league teams. Given that differences have been shown between whole-match activity profiles of winning and losing teams, differences in the within-match activity profiles may also exist between successful and less-successful teams. Therefore, the purpose of this study was to: (1) quantify activity profiles in approximately 5-minute periods to determine if the intensity of rugby league match-play changes following the most intense period of play, and (2) examine if the intensity of activity during predefined periods of match-play differs between successful and less-successful teams playing at an elite standard. In addition, we aimed to account for contextual factors such as ball-in-play and time in attack and defense.

Methods

Participants

Thirty-one players (mean ± SD age; 24.8 ± 3.1 yr) from two elite rugby league teams participated in this study. Participants were competing in the Australian National Rugby League competition. All participants received a clear explanation of the study, including information on the risks and benefits, and written consent was obtained. All experimental procedures were approved by the Institutional Review Board for Human Investigation.
Comparison of High- and Low-Success Teams

Teams were split into ‘high-success’ and ‘low-success’ groups based on the percentage of matches won throughout the team’s season. The high-success team won 71% of matches played, whereas the low-success team won 58% of matches played. Although the difference in the percentage of matches won between the high- and low-success teams (71% vs. 58%) may be considered small in a numerical sense, a difference of 13% in the most recent (2013) rugby league season, differentiated between teams finishing with a final ladder position of 13th and 6th, with the former being excluded from the finals series and the latter being rewarded with a finals series match played on their home ground. Therefore, although these differences may be considered small, the consequences of such a difference could be quite large.

Global Positioning System Analysis

Global positioning system (GPS) analysis was completed during 25 elite matches (15 for the high-success team, 10 for the low-success team), equating to 200 GPS files. The mean (± SD) satellite availability for GPS data samples was 12 ± 1 (high-success team) and 11 ± 2 (low-success team). Positional groups were categorized into adjustables (hooker, halfback, five-eighth, and fullback), hit-up forwards (props, second-rowers, and locks), and outside backs (centre and wing). As this study intended to quantify differences between successful and less-successful teams, interchange players were included in the analysis in order to investigate the activity profiles of each team as a whole.

Movement was recorded using a minimaxX GPS unit (Team S4, Catapult Innovations, Melbourne, Australia) sampling at 10 Hz. The GPS signal provided information on velocity, distance, position, and acceleration. The GPS unit also included a tri-axial accelerometer and gyroscope sampling at 100 Hz, which provided information on physical
collisions and repeated high-intensity efforts. The unit was worn in a small vest, on the upper back of the players.

While recommendations for reporting GPS data have been presented, there is generally a wide range of reporting methods employed in the scientific literature. To date, there are no standardized methods for reporting velocity ‘zones’, and several definitions of what constitutes an ‘effort’ Previous studies of team sport demands have employed 5 Hz technology, and as such have employed broad movement velocity bands due to the larger measurement error with lower sampling frequencies. To allow comparisons with other researchers, data were categorized into: (1) movement velocity bands corresponding to low (0-5 m.s⁻¹) and high (>5 m.s⁻¹) intensities, with total distance covered being represented by the summation of distances covered at these 2 intensity bands, (2) number of collisions; and (3) repeated high-intensity effort bouts. A repeated high-intensity effort bout was defined as 3 or more high acceleration (≥2.79 m.s⁻²), high velocity, or contact efforts with less than 21 seconds recovery between efforts. All data were analyzed using Catapult Sprint software (version 5.1.0.1). The 10 Hz minimaxX units have been shown to have acceptable validity and reliability for measuring sprinting velocities and accelerations. The minimaxX units have also been shown to offer a valid measurement of collisions and repeated high-intensity efforts commonly observed in rugby league.

Segmental Data Analysis

Commercially available match footage was coded for activity and recovery cycles by a member of the research team. Time when the ball was continuously in play was considered activity, while any stoppages during the match (e.g., for scrums, penalties, line drop-outs, tries, and video referee decisions) were considered recovery. The intra-observer reliability was assessed by coding 10 randomly selected matches. The intraclass correlation coefficients
and typical error of measurement for the coding of activity and recovery cycles was 0.95 and 1.2%, and 0.83 and 4.5%, respectively.

First and second half GPS and ball-in-play data for each match were separated into 8 equal periods (mean ± SD: 340 ± 28 seconds). Thus, each match was separated into 16 periods, of approximately 5-minutes, based on the duration of each half. All GPS variables were analyzed in relation to the duration of each period.

Periods which contained the greatest ball-in-play time, total distance, high-intensity running distance, number of collisions, and number of repeated high-intensity effort bouts were identified and compared with the subsequent period, and the mean period (minus the peak and subsequent period). These periods represented: (1) the most intense phase of match-play (peak period), (2) the period following the most intense phase of match-play (subsequent period), and (3) the average demands of all other periods within a match (mean period). For the analysis of the peak, subsequent, and mean periods, files were eliminated from the analysis when the peak period occurred before half-time, full-time, or the player being interchanged. These files were maintained in the dataset for the comparison of predefined periods between the two teams with high- and low-success rates.

Statistical Analysis

Independent t-tests were used to compare means of high- and low-success teams for the percentage of time spent in possession. Factorial analysis of variance (ANOVA) tests were used to identify differences between the peak, subsequent, and mean periods for the same team and to identify differences between peak, subsequent, and mean periods of high- and low-success teams. Any significant differences involving the two teams were followed up using a Tukey honestly significant difference post hoc test. As multiple comparisons were being made, a practical approach determining the scale of difference between high- and low-
success teams was utilized for the analysis of the physical demands across pre-defined periods. Specifically, Cohen’s effect size (ES) statistic and 90% confidence intervals (CI) were used to determine the magnitude of any differences.\(^{34}\) The magnitude of the ES was classified as trivial (<0.2), small (0.21–0.6), moderate (0.61–1.2), large (1.21–2.0) and very large (>2.1).\(^{35}\) Statistical significance was set at \(P<0.05\). Data are reported as mean ± standard deviation.

**Results**

**Ball-in-play**

The high- and low-success teams peak period of ball-in-play was significantly different from their subsequent (\(P = 0.002\), ES = 1.4 ± 0.2, \(P = 0.001\), ES = 1.4 ± 0.3, respectively), and mean period (\(P = 0.001\), ES = 1.9 ± 0.7, \(P = 0.001\), ES = 1.7 ± 0.2, respectively). No significant differences were found between the peak (\(P = 0.558\)), subsequent (\(P = 0.654\)), and mean ball-in-play periods (\(P = 0.867\)) of high- and low-success teams (Figure 1A). Trivial to small differences (ES = 0.1–0.3 ± 0.2) were found between ball-in-play periods of high- and low-success teams across pre-defined periods of match-play (Figure 1B).

**Percentage of match-play spent in possession of the ball**

No significant difference (51.1% ± 4.9 vs. 49.9% ± 5.2, \(P = 0.569\)) was found between the amount of time high- and low-success teams spent in possession of the ball (i.e. in attack) (Table 1).

**Peak, Subsequent, and Mean Periods**

Figure 2 shows the total distance covered, high-intensity running distances covered, number of collisions per minute, and number of repeated high-intensity effort bouts per minute in the high-, and low-success teams during the peak, subsequent, and mean periods.
The peak period contained higher total distance for less-successful adjustables (126 ± 14 m·min⁻¹ vs. 92 ± 12 m·min⁻¹, \( P = 0.001, \text{ES} = 1.5 \pm 0.4 \)), hit-up forwards (126 ± 23 m·min⁻¹ vs. 97 ± 10 m·min⁻¹, \( P = 0.001, \text{ES} = 1.8 \pm 0.6 \)), and outside backs (121 ± 15 m·min⁻¹ vs. 106 ± 17 m·min⁻¹, \( P = 0.041, \text{ES} = 0.9 \pm 0.7 \)), compared with the successful adjustables, hit-up forwards, and outside backs, respectively. Compared with their less-successful counterparts, adjustables, hit-up forwards, and outside backs from the high-success team covered lower total distance during the mean periods of match-play (69 ± 10 m·min⁻¹ vs. 91 ± 14 m·min⁻¹, \( P = 0.001, \text{ES} = 1.4 \pm 0.5 \)), (67 ± 9 m·min⁻¹ vs. 92 ± 9 m·min⁻¹, \( P = 0.001, \text{ES} = 2.0 \pm 0.3 \)), and (68 ± 12 m·min⁻¹ vs. 88 ± 11 m·min⁻¹, \( P = 0.001, \text{ES} = 1.3 \pm 0.6 \)), respectively.

High-intensity running distance was greater during the peak period for less-successful adjustables (17 ± 7 m·min⁻¹ vs. 8 ± 5 m·min⁻¹, \( P = 0.001, \text{ES} = 1.1 \pm 0.7 \)), and hit-up forwards (17 ± 7 m·min⁻¹ vs. 9 ± 5 m·min⁻¹, \( P = 0.001, \text{ES} = 1.4 \pm 0.4 \)), compared with successful adjustables, and hit-up forwards, respectively. The mean period for high-intensity running distance for adjustables, hit-up forwards, and outside backs from the high-success team contained less high-intensity running distance, compared to the same positional groups with lower success rates (adjustables, 2 ± 2 m·min⁻¹ vs. 6 ± 2 m·min⁻¹, \( P = 0.001, \text{ES} = 1.4 \pm 0.6 \); hit-up forwards, 3 ± 2 m·min⁻¹ vs. 6 ± 2 m·min⁻¹, \( P = 0.001, \text{ES} = 1.7 \pm 0.4 \); outside backs, 5 ± 2 m·min⁻¹ vs. 7 ± 2 m·min⁻¹, \( P = 0.001, \text{ES} = 1.2 \pm 0.7 \)).

Adjustables from the high-success team were involved in more collisions per minute than adjustables from the low-success team during the peak period (1.6 ± 0.5 vs. 1.1 ± 0.4, \( P = 0.03, \text{ES} = 1.0 \pm 0.5 \)), and the mean period (0.8 ± 0.3 vs. 0.4 ± 0.3, \( P = 0.025, \text{ES} = 1.1 \pm 0.6 \)). Successful hit-up forwards were involved in more collisions on average when compared with less-successful hit-up forwards (0.8 ± 0.2 vs. 0.7 ± 0.2, \( P = 0.005, \text{ES} = 0.5 \pm 0.3 \)).
In the peak period, hit-up forwards and outside backs with higher success rates were involved in a smaller number of repeated high-intensity effort bouts per minute, compared with hit-up forwards, and outside backs with low success rates (hit-up forwards, 0.3 ± 0.1 vs 0.5 ± 0.1, *P* = 0.008, ES = 0.7 ± 0.4; outside backs 0.2 ± 0.1 vs 0.4 ± 0.1, *P* = 0.009, ES = 1.2 ± 0.7).

**Physical Demands of Successful and Less-Successful Teams during Predefined Periods**

Figure 3 shows the physical demands of selected periods of match-play for the high-, and low-success teams, for total distance covered (TD), high-intensity running distance (HIR), number of collisions per minute, and number of repeated high-intensity effort bouts per minute.

Adjustables from the low-success team covered greater total distance in periods 1, 3-9 and 11-16 (ES = 0.6-1.4 ± 0.5-1.0), greater high-intensity running distance in periods 1-5, 9-16 (ES = 0.8-1.4 ± 0.6-1.4) and were involved in fewer collisions during periods 3, 5, 7, 9-11 and 13 (ES = 0.8-1.0 ± 0.6-0.7) than adjustables from the high-success team.

Compared with hit-up forwards from the high-success team, low-success hit-up forwards covered greater total distance in periods 2-16 (ES = 0.7-1.7 ± 0.4-0.5), greater high-intensity running distance in periods 1, 3, 5, 6 and 8-16 (ES = 0.9-1.5 ± 0.8-1.1) and were involved in fewer collisions during periods 1, 2 and 10 (ES = 0.6-0.7 ± 0.3-0.5).

Outside backs from the low-success team covered greater total distance in periods 2, 3, 5, 7, 9-11, 13 and 16 (ES = 1.0-1.3 ± 0.6-0.7), and greater high-intensity running distance in periods 5, 8 and 16 (ES = 1.0-1.1 ± 0.6-0.7) than outside backs from the high-success team.
Discussion

This study is the first to investigate the activity profiles of rugby league match-play in two elite teams with differing success rates. The present study provides conflicting results with previous research. In a study of one rugby league team, it was demonstrated that greater total distance was covered when winning than when losing, with the greater total distance achieved through greater low-intensity (0-5 m s\(^{-1}\)) distances (i.e. no differences existed in high-intensity running distance between winning or losing). However, it should be noted that the contrasting methods of the previous and present studies may explain these conflicting results. Specifically, the present study investigated the activity profiles of two separate teams with differing success rates (i.e. high-success team vs low-success team), whereas others investigated the results of one team (i.e. one team when winning vs the same team when losing). Therefore, our conflicting results may reflect: (1) technical and tactical differences representing a greater distinguishing factor between successful and less successful teams, or (2) success being the result of a multifactorial relationship between technical and tactical effectiveness and activity profiles, more so than merely activity profiles in isolation.

In contrast to some but not all studies, our results highlight that an ability to cover greater total distance, or greater high-intensity distance, does not result in greater competitive success. Moreover, our findings demonstrate that less-successful teams are subjected to a greater running workload in terms of total distance covered and distance covered at high-intensities. Given that no significant differences were found for the percentage of time the two teams spent in possession of the ball, the differences in the average running demands is unlikely to be the result of a greater amount of time spent defending, which has been shown to elicit greater running demands than attacking. Furthermore, it has previously been hypothesized that the poorer match performance of losing teams results in a greater amount of scrambling in defense, which in turn, increases the
amount of high-intensity running performed. Indeed, poor defense and missed tackles in rugby league may result in the need for players to cover-defend and pursue members of the opposition, therefore resulting in greater high-intensity running distance.

Another novel finding of this study is that lower running workloads achieved by the high-success team were coupled with a greater number of collisions than the low-success team. Recent evidence may offer possible explanations for our results. Firstly, it has recently been demonstrated that the inclusion of collisions to small-sided games challenges a player’s ability to maintain running performance and results in elevated markers of muscle damage. Therefore, the high-success team’s involvement in a greater number of collisions may have resulted in a fatiguing effect, which reduced running performance. Secondly, we would suggest a more plausible explanation is that the high-success cohort were able to effectively slow the ‘play-the-ball’ while defending. This could be achieved by tactical strategies that employ more players to complete each tackle on more occasions (i.e. 2 and 3 players per tackle on a greater number of occasions), effectively resulting in: (1) a greater number of collisions, as more players are involved in each tackle and (2) a slower ‘play’ that may not require the need for players to cover greater total distance or high-intensity distance.

In addition to the more successful cohort being involved in a greater number of collisions, the more successful hit-up forwards were involved in a moderately greater number of collisions during the initial periods of play (periods 1 and 2). These findings are not surprising given that RHIE bouts that contain a greater number of contact efforts are more likely to occur in higher level competitors. Collectively, these data highlight that to ensure competitive success, not only is a player’s ability to be involved in repeated collisions vital, but also these collisions must occur in greater numbers during the initial stages of a match. Furthermore, the fact that our results demonstrated the greatest differences amongst hit-up
 forwards and adjustables may suggest that the workload of these positional groups have a greater effect on team success than that of the outside backs.

The analysis of the physical demands throughout predefined periods demonstrates a trend for the total distance and high-intensity running distance of the low-success team to increase during the latter periods of the second half (Figure 2A,D,E,F). These findings provide conflicting results to previous studies that have highlighted that physical output decreases in the second half of match-play. However, recent evidence has also demonstrated that teams completing the season in the bottom four positions of the ladder increased their high-intensity running distance in the second half of matches, whereas teams finishing in the middle four, and top four ladder positions decreased, and maintained high-intensity running distance, respectively. These observations have been supported by others, who have demonstrated that less-successful teams display a greater ‘end-spurt’ than teams with higher success rates. The findings of the present and previous studies suggest that increases in physical output during the latter stages of match-play may be linked with a poorer rate of success. Furthermore, these increases in running workloads could be the result of players preserving physical output during the earlier stages of match-play, therefore facilitating an increase in intensity upon anticipating the end of the match. Alternatively, this result may indeed be due to the inclusion of interchange players, a contrast in methodology that should be noted when comparing our findings with others.

Recent evidence has demonstrated that pre-defined periods underestimate the peak demands of match-play, when compared with a rolling time scale (i.e. match intensities after every time point for the next 5-min period). As such, we highlight that interpretation of these results should be performed with caution, due to our segmental periods being pre-defined. Finally, as only trivial and small differences were found between the ball-in-play time of the high- and low-success team across any of the pre-defined periods, we concluded
that the differences in physical demands of the two teams is not the result of differences in ball-in-play time. However, given that significant differences were found in ball-in-play time across peak, subsequent, and mean periods, we are circumspect in suggesting that reductions in physical output following the peak period were the result of fatigue, as opportunities to perform physical work may have been limited.

**Practical Applications**

The results of this study demonstrate that compared with a more successful team, a less successful team covers greater total distance, performs more high-intensity running, and depending on position is involved in a greater number of repeated high-intensity effort bouts. Therefore, these findings suggest that greater amounts of high-intensity activity and total distance are not related to success in elite rugby league. Our data suggest that a greater number of collisions are linked with a greater rate of success. These findings are of importance to coaches and sport scientists when interpreting time-motion analyses, as our results may indicate that overall technical and tactical effectiveness of the team rather than greater running workloads may indeed be a greater determinant of success, or success may be dependent upon a myriad of factors unrelated to activity profiles.

**Conclusion**

Coaches and sport scientists should note that greater running workloads are not indicative of success in elite rugby league match-play. These findings are of importance to practitioners when interpreting time-motion analyses, as this may indicate that: (1) technical and tactical differences may be the distinguishing factor between successful and less successful teams, or (2) success is the result of a multifactorial relationship between technical and tactical effectiveness and activity profiles, more so than merely activity profiles in isolation.
References


Figure 1 Peak, subsequent, and mean ball-in-play (A), and ball-in-play across predefined periods of match-play (B). Data are presented as mean ± standard deviation.

#Denotes significant difference (P<0.05) from the subsequent and mean period for the same team.
Figure 2 Peak, subsequent, and mean total distance covered, high-intensity running (HIR) distance covered, number of collisions per minute, and number of repeated high-intensity effort (RHIE) bouts per minute for adjustables, hit-up forwards, and outside backs from successful and less successful teams. Data are presented as mean ± standard deviation. Adjustables = A, D, G, J; Hit-Up Forwards = B, E, H, K; Outside Backs = C, F, I, L.

*Denotes significant difference (P<0.05) between teams for the same period.

Denotes significant difference (P<0.05) from the subsequent period for the same team.

Denotes significant difference (P<0.05) from the mean period for the same team.
Physical demands across predefined periods of match-play for elite high- and low-success teams, for total distance covered, high-intensity running (HIR) distance covered, number of collisions per minute, and number of repeated high-intensity effort (RHIE) bouts per minute. Data are presented as mean ± standard deviation.

Adjustables = A, D, G, J; Hit-Up Forwards = B, E, H, K; Outside Backs = C, F, I, L.

H denotes halftime.

*Denotes moderate effect size (0.61-1.2) between teams for the same period.

*bDenotes large effect size (1.21-2) between teams for the same period.
Table 1 Percentage of match-play spent in possession of the ball (i.e. attacking) for the successful and less successful teams. Data are presented as mean ± standard deviation.

<table>
<thead>
<tr>
<th>Team</th>
<th>Time-in-possession (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-success</td>
<td>51.1 ± 4.9</td>
</tr>
<tr>
<td>Low-success</td>
<td>49.9 ± 5.2</td>
</tr>
</tbody>
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